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WASHINGTON, D.C. 20036

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(1926-1991)

August 2, 1999

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Megalie Roman Salas, Esq., Secretary  
FEDERAL COMMUNICATIONS COMMISSION  
455 Twelfth Street, SW  
Washington, D. C. 20554

Dear Mrs. Salas:

Enclosed are the original and nine copies of the Comments of Smith and  
Fisher in MM Docket No. 99-25.

Respectfully submitted,

  
Neil M. Smith

NMS/nj

Encl.

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Before the  
Federal Communications Commission  
Washington, D. C. 20554

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In the Matter of:

Creation of a Low-  
Power Radio Service

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MM Docket No. 99-25

RM-9208  
RM-9242

COMMENTS OF SMITH and FISHER

The firm of Smith and Fisher, and predecessor firms, have engaged in the practice of broadcast allocation engineering for nearly 30 years. Further, one of the partners (Smith) regularly teaches the broadcasting portion of a course in radio spectrum management at George Washington University. We therefore believe that we have the expertise to provide brief but meaningful Comments in this matter.

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A basic starting point in allocation engineering is a knowledge of the characteristics of the receivers in the hands of the public. Such information permits one to establish a threshold value of signal strength for adequate reception and the levels of signal strength on co- and adjacent channels that represent the threshold of interference. With this knowledge, one may proceed to devise an allocation scheme that can achieve the desired policy goals.

Unfortunately, in seeking to authorize low-power FM stations, the Commission has conducted no such studies. The engineering support for this proposal consists largely of examples of how many low-power stations can be authorized under various scenarios, relying on—or, alternatively, ignoring—the interference ratios set forth in §73.215. It is suggested that second-

and certainly third-adjacent-channel interference isn't of significance, although there is nothing more than anecdotal evidence that such is the case. The fact of the matter is that second- and third-adjacent-channel interference is not well understood.

Our present system of FM allocations began in 1962 with the *First Report and Order* in Docket No. 14185. In that proceeding the concept of a Table of [FM] Allocations was adopted, along with the idea of station classes and minimum separations. Before then, interference ratios were established as -20 db (co-channel), -6 db (first-adjacent channel), +20 db (second-adjacent channel), and +40 db (third-adjacent channel). The Commission did not change these ratios in Docket No. 14185, but since it was adopting separation standards, it held it unnecessary to continue to specify such ratios in the Rules. It relied upon these ratios in its calculations for establishing the co- and first-adjacent-channel spacings, but it did not employ ratios in establishing the second- and third-adjacent-channel spacings. Instead, it decided that it would require second- and third-adjacent-channel stations to be outside each other's service area. Having established protected distances of 15 miles for Class A, 40 miles for Class B, and 65 miles for Class C, it used these distances as the required spacings for the second- and third-adjacent-channel relationships.

Note that it did not change the ratios. It simply ignored them in establishing the second- and third-adjacent-channel spacings, and it omitted all reference to these ratios in its new Rules. However, it decided to continue employing a contour protection system for noncommercial FM stations, so it retained the specified ratios, where they remain today [§73.509(a)]. Indeed, these ratios appear in the Canadian-USA FM broadcasting agreement.

The ratios for second- and third-adjacent-channel interference in §73.215 are both

+40 db, and it appears that some consider this a more proper standard, since it is newer, dating from about ten years ago. However, in Docket No. 87-121, the proceeding that established §73.215, the ratios were originally set forth as +20 db for second-adjacent channels and +40 db for third-adjacent channels. Upon reconsideration, the Commission decided that it would employ the +40 db ratio in both cases, simply to be consistent with the identical spacing requirements.

Thus, we have reached a point at which our regulatory standards for second- and third-adjacent-channel interference are in conflict with each other and are based on virtually nothing. This is hardly a foundation on which the Commission can properly build a new class of FM stations.

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Second- and third-adjacent-channel interference can be appreciated only on a statistical basis. Because the ratio is strongly positive, interference can result only where the undesired signal is significantly stronger than the desired signal. The layman may conclude from this that if two stations are separated by two or three channels but are colocated and operate with the same power and height, they will have equal field strength at all locations, and, therefore, no interference to either station could result.

The fallacy in this reasoning—and the reason why the Commission has never permitted this approach to allocations—is that our knowledge of propagation is statistical. We can determine the field strength that may exist at a given distance only at, say, 50 percent of locations, 50 percent of the time. Thus, a different field strength will exist at any other percentage of locations or percentage of time. Given a substantial positive interference ratio, such

propagation vagaries may not produce a significant problem at fixed receiving sites, but a major, if not critical, aspect of FM radio broadcasting is reception in automobiles. Here, the desired and undesired signals vary rapidly and randomly as one drives through the service area. Second- and third-adjacent-channel interference comes and goes sporadically and unpredictably.

Such interference is not generally reported to a regulatory agency. Listeners experiencing the problem think of it as just some sort of transmission irregularity and simply tend to switch to a different station with similar format but better reception. This interference degrades mobile reception selectively and can seriously affect broadcast competition. So, even where the conditions approach the ideal, interference will result here and there, now and then, and the statistical result is a significant reduction in listenership for the unlucky station.

The Commission has wisely refused to fall into this statistical trap in the past, and absent proper engineering data, it should refuse to do so now. To ignore or downgrade the importance of second- and third-adjacent-channel interference in this proceeding would be to ignore the engineering precedents of the Commission.

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We hope that one or more parties commenting in this proceeding will provide actual measurement data that will establish the facts necessary for a proper decision. However, if no such information is forthcoming, the Commission will be left with no basis for the adoption of these Rules. Furthermore, the Commission cannot simply state that it does not have the resources to conduct the necessary studies and adopt the proposal without them. If it does not have the resources to conduct this critical research, it hasn't the resources to create a

Low-Power Radio Service.

A handwritten signature in black ink, appearing to be 'h' followed by a long horizontal stroke.

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July 30, 1999